

We can classify the graphs of functions as either even, odd, or neither.

Even

A function is an even function if _____ for all x in the domain of f .

If (x, y) is a point on an even function, then so is _____

Even functions are symmetric with respect to the _____. This means we could fold the graph on the ____-axis, and it would line up perfectly on both sides!

Odd

A function is an odd function if _____ for all x in the domain of f .

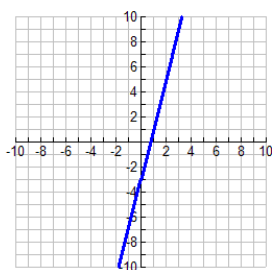
If (x, y) is a point on an odd function, then so is _____

Odd functions are symmetric with respect to the _____. This means we can rotate image 180 degrees and it will appear exactly the same!

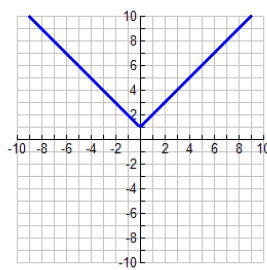
If we cannot classify a function as even or odd, then we call it neither!

Directions: Determine graphically using possible symmetry, whether the following functions are even, odd, or neither.

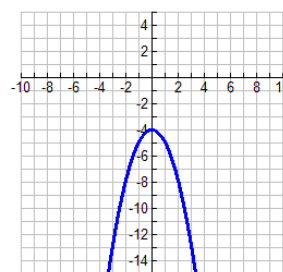
1.



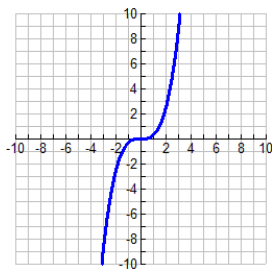
2.



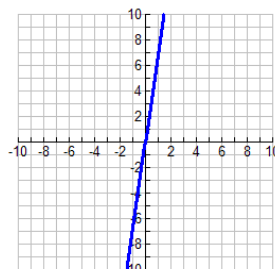
3.



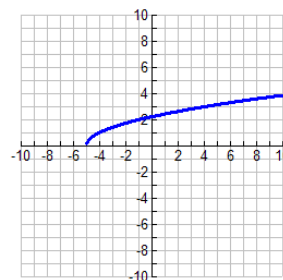
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5.



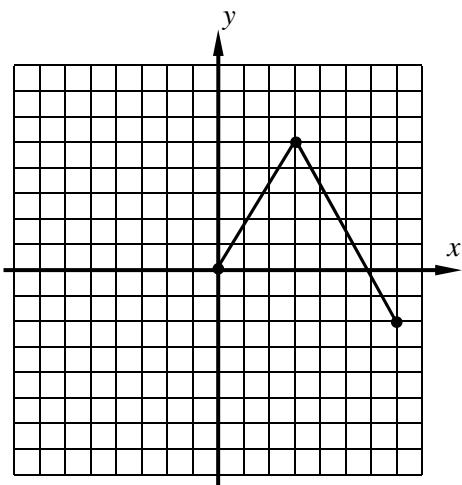
6.



Consider the **partial graph** of the function $f(x)$ shown twice below. Sketch the other half of the function if in

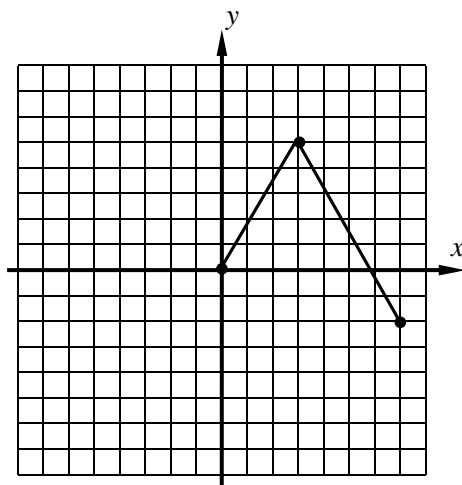
(a) $f(x)$ is **even** and in (b) $f(x)$ is **odd**. The three coordinate pairs are listed to help you plot.

(a) **even**



$(0, 0), (3, 5), (7, -2)$

(b) **odd**



$(0, 0), (3, 5), (7, -2)$

Directions: Verify algebraically whether each function is even, odd, or neither!

1. $f(x) = x^3 - 6x$

2. $g(x) = x^4 - 2x^2$

$$3. h(x) = x^2 + 2x + 1$$

$$4. f(x) = x^2 + 6$$

$$5. g(x) = 7$$

$$6. h(x) = x^5 + 1$$

9. $h(x) = |x| - 1$

10. $f(x) = \frac{1}{1+x^2}$

11. $f(x) = \frac{3x}{5-x^2}$

12. $f(x) = \frac{1}{3x+x^2}$

13. If $f(x)$ is an even function and $f(-3) = 7$, find the value of $2f(3) + 5f(-3)$.

14. If $f(x)$ is an odd function and $f(-3) = 7$, find the value of $2f(3) + 5f(-3)$.

EVEN AND ODD FUNCTIONS

COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. Given the partially filled out table below for $f(x)$, fill out the rest of it based on the function type.

(a) Even

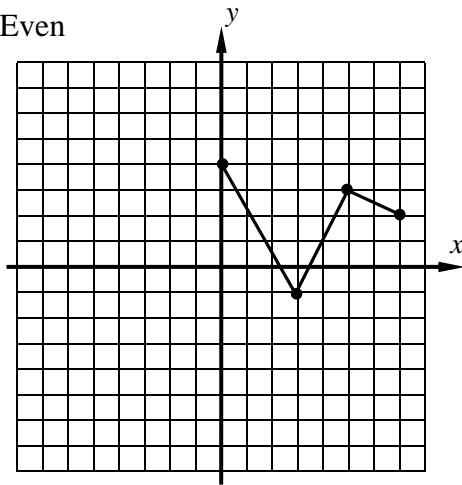
x	-3	-2	-1	0	1	2	3
y	5		-7	4		-4	

(b) Odd

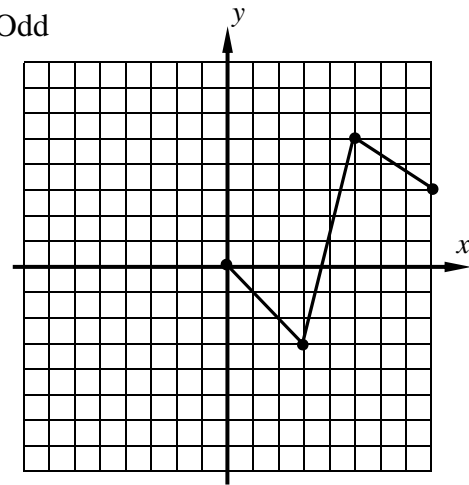
x	-3	-2	-1	0	1	2	3
y	5		-7	0		-4	

2. Half of the graph of $f(x)$ is shown below. Sketch the other half based on the function type.

(a) Even



(b) Odd



3. If $f(x)$ is an even function and $f(3) = 5$ then what is the value of $4f(3) + 2f(-3)$?

(1) 30

(3) 10

(2) 60

(4) 6

4. If $g(x)$ is an odd, one-to-one function and if $g(7) = -2$, then which of the following points *must* lie on the graph of the inverse of $g(x)$, $g^{-1}(x)$. Explain how you made your choice.

(1) $(-7, 2)$

(3) $(2, 7)$

(2) $(2, -7)$

(4) $(7, -2)$

5. Which of the following functions is even? Explain how you arrived at your choice.

(1) $y = x^2 - 4x$

(3) $y = 9 - x^2$

(2) $y = |x - 6|$

(4) $y = 4^x$

6. Determine algebraically if function $f(x) = \frac{4x^2 + 2}{x}$ is either even or odd..

REASONING

7. Even functions have symmetry across the y -axis. Odd function have symmetry across the origin. Can a function be both even and odd?

8. Even functions have symmetry across the y -axis. Odd function have symmetry across the origin. Can a function have symmetry across the x -axis? Why or why not?